AGRI·FOOD

ECONOMIC & REGIONAL DEVELOPMENT AGREEMENT

Eastern Grassland Society

EASTERN GRASSLAND SOCIETY

FORAGE . . . THE ROOT OF IT ALL

MANITOBA, CANADA

ANNUAL REPORT 1987

Canada

Manitoba

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Eastern Grassland Society

The Eastern Grassland Society is a forage-livestock producer's organization located in the Eastern Region of Manitoba. The objective of the Society is to encourage good forage management practises and the efficient use of forage by livestock.

The activities of the Society include the operation of a Grassland and Livestock Demonstration project at Seven Sisters in co-operation with Manitoba Agriculture which involves both beef and dairy cattle. Through funds from Agriculture Canada (PFRA) and Manitoba Agriculture, the Society also has an Agri-Food contract to conduct on-farm, forage-livestock demonstration projects. This agreement was signed in August 1985 and will be completed in 1990.

The Society is managed by a board of directors who determine the activities of the Society.

Membership in the Society, at a cost of $5, is open to any Eastern Region producer. Members recieve information on various aspects of forage-livestock production, participate in field days, tours and courses. They are also involved in the various demonstration projects. For more information write to: Box 50 Beausejour Man. ROE OCO or phone 268-1411.

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Crops Management Demonstrations

Feed Grain Demonstrations were established to evaluate the potential of feed grain on marginal soils using recommended varieties of barley and oats.

Cooperator: **Brian Proceviat of Elma** seeded 6 acres of Robust and 6 acres of Sampson Barley on 12 acres of shallow peat on May 18th. Phosphate was applied at 90 lbs per acre in the seed row.

The crop was affected in mid July to crown rot and net blotch. The Sampson lodged more than than the Robust. Both varieties yielded 45 bu/acre.

Cooperator: **Roy Nichol of River Hills** seeded 15 acres of Riel oats and 22 acres of Fidler oats on May 10th at 3 bus per acre. The fertility applied was : N 60, P 30 applied per acre with the seed.

The Riel yielded 69 bus per acre and the Fidler 58 bus per acre.

Feed Grain Storage demonstration was conducted at the farm of **Ueli Messerli** of Beausejour. This demonstration was to evaluate an alternative method of low cost storage of high moisture grain.

Two Lode King bottom bins were modified to store high moisture grain of approximately 23-28% moisture. The bins were fitted with air tight lids with an internal agitator to prevent bridging of the grain and a breather system. The unloading system moved the grain directly into a roller mill for processing and feeding system.

1987-88 results indicate no freezing or spoilage problems at moisture contents of 24%. Feed analysis and temperature monitoring indicate good quality feed.

Results for the three year period indicate that this system has potential as a lower cost storage system than currently is used in most farm operations. The project has been on-going since 1985, a final report will be available in Sept. 1988. For more information contact Ueli Messerli or Gary Plohman, P.Eng. with Man. Agric. 268-1411

Forage and Livestock Management Demonstrations

Pasture Management

Two pasture management demonstrations were conducted in the La Broquerie area to demonstrate the potential pasture production from pasture for dairy cows. One pasture project was on a sandy loam and the other on a peat soil.

Eric Eising, a La Broquerie area dairy farmer initiated a pasture management demonstration in 1987 with the Eastern Grassland Society with the purpose of optimizing the efficiency of milk production from improved pasture.

A new pasture was seeded in late May with the EGS Cambridge roller to a mixture of meadow brome, timothy, alfalfa and trefoil with an oats-annual rye companion crop . After a slow start due to an unusually dry June, timely rains through the remainder of the summer into the fall resulted in an excellent initial growth and three subsequent regrowths that were grazed by the milking herd of 50 cows.

Through the use of a moveable "tumble-wheel" electric fence line, which is a new type of electric fencing equipment, Eric was able to rotationally graze his milking cows over this new pasture. The Tumble Wheel eliminates the need for posts as the electric wire is suspended by wheels which make possible the easy movement of the wire and more controlled grazing.

Eric's grazing system allowed for a rest period for the plants to regrow and because the pasture was newly seeded, a chance for the new seedlings to get established. The forage produced was used effectively while eliminating the dips in the milking herd's production. The other major benefit of the pasture was that less grain supplementation was required while the cows were on pasture.

Timely rains also were responsible for an excellent forage growth and meant that late season corn silage supplementation was also not required as was the case in previous years.

The high power, smooth wire fencing system was found very effective for livestock control.

For the future, Eric envisages two tumble wheel fences which would be used simultaneously to create a single fixed size "moveable paddock" in which the cattle would be rotated over the season. Split nitrogen applications, he believes, would also be beneficial particularly on the lighter textured soils which are predominant in the area.

No matter what, Eric believes that some measure of planning is essential, "you have to rotate your pasture, don't graze to blacktop". The reward is maximum production to the landbase from Forage!

Heinz Reimer of La Broquerie has found that forages grow well on peat soils and can be used very economically for pasture. Heinz operates a dairy farm that utilizes pasture on both mineral and peat soils as well as dry lot feeding in his forage operation.

Eleven acres of his pasture program involves the use of forages grown on peat soil. In 1987 this pasture grazed his herd of 29 cows for 46 grazing days or 121 animal grazing days per acre.

This peat pasture was seeded in 1985 to a mixture of timothy, orchard, creeping red fescue and alfalfa. The timothy and the fescue are particularly well suited to peat soils and were the dominant species in the sward by 1987. "There was still some orchard left in 1987" he said, "but the alfalfa was nearly all gone from winterkill".

The fertilizer used in 1987 was N:40 P:31 K:65 kg/ha at a cost of $26 per acre. The cows were turned out on this pasture on June 17th and were rotationally grazed with other pastures or dry lot fed hay and grain until Aug.26th when supplemental forage feeding was started on the pasture. Prior to this, the pasture was the only forage source for the herd of 24 milking cows and 5 dry cows.

The milk produced per acre from the peat pasture was 2,448 liters and an average of 585 liters per grazing day. The cash production cost was an estimated $32 per acre which included the fertilizer and the cost of forage establishment but does not include the additional grain fed at milking.

While Heinz was quite pleased with the milk production on the pasture, there was a drop of butterfat from 3.5% to 3.0% when they were switched from dry lot and hay to the pasture. "That's what you would expect though, but the additional milk production was enough to compensate. The cows also consumed less grain when on pasture compared to when on dry lot and hay. In the parlor they were not too interested in the grain after a full feed on pasture."

This farm experience indicates that peat soils can be very productive and will produce excellent returns as pasture provided adaptable forage species are used and a fertility program to maintain a productive stand.

Other forage species that may have potential on peat soils are: Meadow Foxtail which is very cold tolerant and does well on moist soils. It does need to be grazed early in the season however. Meadow Brome is a pasture type of brome as it does recover well from grazing, and also has potential on peat soils. Some of the new selections of Reed Canary grass such as Palaton and Venture are low in alkaloids and will produce excellent pasture forage on peat soils.

A planned grazing system is required to produce the maximum return to a pasture by harvesting each forage species at the optimum. This requires subdivision of the pasture into four to six fields for the best control of the grazing animal.

"A simple 'no' would have been enough!"

Cell Grazing Demonstrations:

Cell grazing is a term used to describe a pasture system where the pasture area is subdivided into several paddocks, usually more than 4 and as many as 20 paddocks.

The purpose of increasing the number of paddocks in a grazing cell is to:

a) Increase the stock density per acre so as to obtain a more even grazing of the forage and to reduce selective grazing.

b) Provide for longer rest periods so as to allow for regrowth of the productive forage species. This should have the effect of maintaining or improving the more productive forage species which often are killed out by over grazing.

The objective of these projects were to evaluate the effect on a pasture of subdivision. Each project will be monitored over several years to determine the effect of the grazing on forage species composition, stocking rates and livestock productivity.

All subdivisions involved the use of high tensile wire and high power electric fencers.

Locations established in 1987 and to be monitored in 1988:

a) Wayne Lenfesty, Libau: 200 acres subdivided to 8 paddocks
b) Ken Blocker, Dugald: 640 acres subdivided to 6 paddocks
c) Cliff Hunter, Ridgeville: 640 acres subdivided to 6 paddocks

The following are the formulas used to calculate grazing periods and animal days per acre:

1: To determine the number of paddocks required = $\frac{\text{Resting Days}}{\text{Grazing Days}} + 1$ eg: $\frac{30}{5} + 1 = 7$ paddocks

2: To determine days grazing per paddock:
Grazing periods are adjusted during the season.
Fast moves during the fast growth season and slow moves during the slow growth period.
(This example has 7 paddocks and a 30-60 day rest period depending on the growing season.)

a) Fast growth period = $\frac{\text{Min. Days Rest}}{\text{\# Paddock - 1}}$ eg: $\frac{30 \text{ Days}}{7 - 1} = 5$ days

b) Slow growth period = $\frac{\text{Max. Days Rest}}{\text{\# Paddock - 1}}$ eg: $\frac{60 \text{ Days}}{7 - 1} = 10$ days

3: To adjust grazing period to field size or grassland production:

$$\frac{\text{Paddock quality}}{\text{Avg. Paddock quality}} \times \text{grazing days}$$

eg: $\frac{35}{25} \times 5 = 7$

(7 grazing days per cycle)

Paddock quality is an indication of the grazing potential of a paddock.

Four locations were monitored in 1987:

a) **Conrad Caya, Great Falls** Acres: 88 Animal Units: 35
Stock density per paddock: 1.6
(animal units/acres per paddock)

Paddock Number	1	2	3	4	AVG.
Acres per paddock	25	20	20	20	21
Grazing days per paddock	28	28	35	28	30
Animal days per acre	39	49	61	49	49.6
Productivity per paddock (% of avg)	79	98	123	98	

b) **Les Kurbis, Beausejour** Acres: 168 Animal Units: 65
Stock density per paddock: 2.3

Paddock Number	1	2	3	4	5	6	AVG
Acres per paddock	32	18	20	16	26	56	
Grazing days per paddock	16	141	13	18	41	33	
Animal days per acre	22	186	29	50	69	26	39*
Productivity per paddock	56	-	74	128	177	143	

* Paddock 2 was set stocked and the results are not included in the average.

c) **Seven Sisters Grassland Project** Acres:114 Animal Units:119
Stock density per paddock: 5.8

Paddock Number	1	2	3	4	5	6	7	AVG
Acres per paddock	15	22	27	32	15	15	18	
Grazing days per paddock	55	44	45	40	52	4	89	
Animal days per acre	120	158	74	52	149	18	122	112*
Productivity per paddock								
Recommended grazing schedule	5/11	3/7	3/6	2/5	6/13	1/2	5/11	

Note: Grazing schedule refers to days grazing per paddock during the fast and slow growth periods.

* Paddock number 6 not included in average.

Pasture Grazing Schedule - Lee Kurbis 1987

Paddock number	acres	June in	June out	# A.U.	July in	July out	# A.U.	August in	August out	# A.U.	September in	September out	# A.U.	October in	October out	# A.U.
1	32	6/ 1	6/17/	44.00												
2	16	6/ 1	6/ 4/	21.75				6/ 4	10/20	25.50						
3	20							6/ 6	6/21	44.00						
4	16				7/21	8/ 6	44.00									
5	26	6/17	7/ 7/	44.00							8/21	9/11	44.00			
6	56				7/ 7	7/21	44.00							9/11	9/30	44.00
	166															

Number of Paddocks: 6

Paddock #	Animal days/acre	Paddock Quality	Grazing Days
1	22	35	16
2	186	293	141
3	29.	45	13
4	50.	78	18
5	69.	109	41
6	26.	41	33
	64.		

Livestock Production:

43 cows gained	5,670
43 calves gained	14,335
1 bull gained	120
29 Holsteins gained	9,275
5 Holsteins gained	970
Total lbs gain:	30,370

Livestock Return per acre: 180.8 lbs

Pasture Grazing Schedule:
print:al:ac35

Date: 1987

Name: Caya Farms Great Falls

Paddock #	acre	quality	Grazing prd min	max.	May In	Out	June In	out	July in	out	August in	out	September in	out	October in	out	Days Grazing	Animal D/acre
1	25	79	8	16	5/24	5/31	6/21	6/28			8/ 2	8/16					28	39.20
2	20	99	10	20			5/31	6/ 7	6/28	7/ 5	8/16	8/30					28	49.00
3	20	123	12	25			6/ 7	6/14	7/ 5	7/19			8/30	9/13			35	61.25
4	20	99	10	20			6/14	6/21	7/19	8/ 2			9/13	9/20			28	49.00
5																		
6																		
7																		
8																		
9																		
10																		
4	85	100																

TOTAL: 119 av 49.61

Days Rest:
Min.days 30
(fast growth)
Max.days 60
(slow growth)

Animal Units:	# head	# head	# head	# head	# head	# head
Cows:	35	35	35	35	35	35
Calves	34	34	34	34	34	34
Yearlings						
Total An. Unit	35	35	35	35	35	35

Pasture Plan - Heins Reimer
NW 5-6-7E LaBroqueries 328-1462
print al:146

Cows on pasture:		No. Cows milk	dry	Milk liters	grazing days	milk l/cow	avg milk per prd.
6/17/87	6/19/87	26	4	1122	2	22	90
6/19/87	6/21/87	26	4	1241	2	24	100
6/21/87	6/23/87	26	4	1237	2	24	99
6/23/87	6/25/87	26	4	1228	2	24	99
6/25/87	6/27/87	23	6	1167	2	25	106
6/27/87	6/29/87	23	6	1197	2	26	109
6/29/87	7/ 1/87	23	6	1168	2	26	106
7/ 1/87	7/ 3/87	25	2	1178	2	24	98
7/ 3/87	7/ 5/87	25	2	1180	2	24	99
7/ 5/87	7/ 7/87	25	2	1170	2	23	98
7/ 7/87	7/ 9/87	25	2	1163	2	23	97
7/ 9/87	7/11/87	25	2	1148	2	23	98
7/11/87	7/13/87	25	2	1145	2	23	96
8/ 6/87	8/ 8/87	24	7	1142	2	24	99
8/ 8/87	8/10/87	24	7	1177	2	25	102
8/10/87	8/12/87	24	7	1150	2	24	100
8/12/87	8/14/87	24	7	1137	2	24	99
8/14/87	8/16/87	24	7	1134	2	24	99
8/16/87	8/18/87	24	7	1137	2	24	99
8/18/87	8/20/87	24	7	1131	2	24	98
8/20/87	8/22/87	24	7	1170	2	24	102
8/22/87	8/24/87	24	7	1170	2	24	102
8/24/87	8/26/87	24	7	1220	2	25	106
		24	5	26930	46	24	

Acres grazed: 11

Pasture mixture:
timothy
alfalfa
creeping red fescu
orchard grass

seeded in 1985

Milk produced per acre: 2,448 liters

Milk produced per grazing day:
585 liters

Milk produced per cow per day:
24 liters

Total animal grazing days per acre
121.3

Cost of Pasture:

establishment:	
$20/acre over 3 years	86.66
fertilizer:	
N:40 P:31 K:65	$26.00
	$32.66/acre

Pasture Grazing Schedule - Seven Sisters Grassland Project 1987

print alias56

Paddock number	acre	May in	May out	May # A.U.	June in	June out	June # A.U.	July in	July out	July # A.U.	August in	August out	August # A.U.	September in	September out	September # A.U.	October in	October out	October # A.U.
1	15	5/13/87	6/ 1/87	42				7/13/87	7/20/87	28	8/ 9/87	8/14/87	28	8/25/87	9/ 8/87	28	9/25/87	10/ 5/87	28
		56 beef heifers						38 dairy heifers			38 dairy heifers			38 dairy heifers			38 dairy heifers		
2	11							7/ 3/87	7/13/87	28	8/14/87	8/25/87	28	9/10/87	9/25/87	28	10/12/87	10/15/87	28
								(38 dairy)			(38 dairy)			(38 dairy)			(38 dairy)		
	11							7/27/87	8/ 9/87	67									
								101 cows/calves/heifers											
3	27	5/26/87	6/13/87	25	6/27/87	7/ 3/87	25	7/13/87	7/20/87	67				8/31/87	9/14/87	67			
		25 beef cows/calves			25 beef cows/calves			101 cows/calves/heifers						101 cows/calves/heifers					
4	32	6/13/87	6/27/87	25				7/ 3/87	7/13/87	25	8/ 9/87	8/25/87	67						
		25 beef cows/calves						25 beef cows/calves			101 cows/calves/heifers								
5	15				6/ 1/87	7/ 3/87	28	7/20/87	7/27/87	67	8/25/87	8/31/87	67	9/10/87	9/25/87	67			
					38 dairy heifers			101 cows/calves/heifers			101 cows/calves/heifers			101 cows/calves/heifers					
6	15													9/14/87	9/10/87	67			
														101 cows/calves/heifers					
7	18	5/22/87	6/ 1/87	28	6/ 1/87	7/13/87	21	7/20/87	8/ 9/87	28				9/ 8/87	9/10/87	28	10/ 5/87	10/12/87	28
		38 dairy heifers			29 beef heifers			38 dairy heifers						38 dairy heifers			38 dairy heifers		
	144			129			70			310			190			285			84

No. of paddocks: 7

Paddock #	Animal days/acre	Grazing days	Paddock quality	Grazing schedule Min.	Grazing schedule Max.
1	120	35	139	9	11
2	79	31	91	3	7
	79	13	91	3	7
3	74	48	86	3	6
4	52	40	60	2	5
5	149	52	172	6	13
6	18	6	21	1	2
7	122	89	141	5	11
An.Days/acre	87		100		

Animals:	# Head	Animal Units
Beef heifers:	34	42
Dairy heifers:	38	28
Beef cows:	25	25
Beef calves:	25	
	104	119

Minimum rest period:
30 days

Maximum rest period:
60 days

SEVEN SISTERS GRASSLAND PROJECT 1987

The Seven Sisters Grassland Project has been in operation since 1980 and has demonstrated the potential return to pasture possible on some marginal crop land in Eastern Manitoba.

There have been 318 producers who have participated in these practical demonstrations by supplying their own cattle (1210 head) which included beef cows and calves, steers for finishing, beef heifers both for finishing and replacement, and replacement dairy heifers. A summary of the results are listed in Table 1:

Table 1: Return per Acre to Grassland from Pasture

Year	Rainfall (inches)	No. Head	No. Acres	Lbs. Gain/Acre
1983	10.5	173	144	223
1984	13.5	172	130	219
1985	14.3	180	130	295
1986	16.5	212	122	367
1987	12.8	144	124	310

The results indicate that there is a potential for pasture as a crop on land as an alternative to other more traditional crops. In the past only land not suited to cropping was used for pasture. There is a potential for an economic return to the land base through livestock.

Seven Sisters Grassland Project

The objective of the Seven Sisters Grassland Project is to demonstrate to forage-livestock producers, technology and management systems that are most suited to the Eastern Region.

Site description:

The Seven Sisters Grassland Project is located three kms. north and two kms. west of the junction of PTH 44 and 11.

The soil type is a Piney fine sandy loam which, with some stone problems, results in a Class IV soil rating. The project site is located to the east of a forestry and swamp area which is a source of severe fly problems (Horse Flies).

The climate in 1987 was 162 frost free days (April 22 - October 1) and 320 mm (12.8 inches) of precipitation from April 1st to October 1st.

The pasture is on Crown Land and consists of 58 ha (144 acres) which is subdivided into 7 paddocks as is indicated on the pasture plan Figure 1. The perimeter fencing is barb wire with cross fencing using a single strand high tensile electric wire. A central alley provides access to all paddocks and a central watering area. Permanent handling facilities are located to the south end of the pasture.

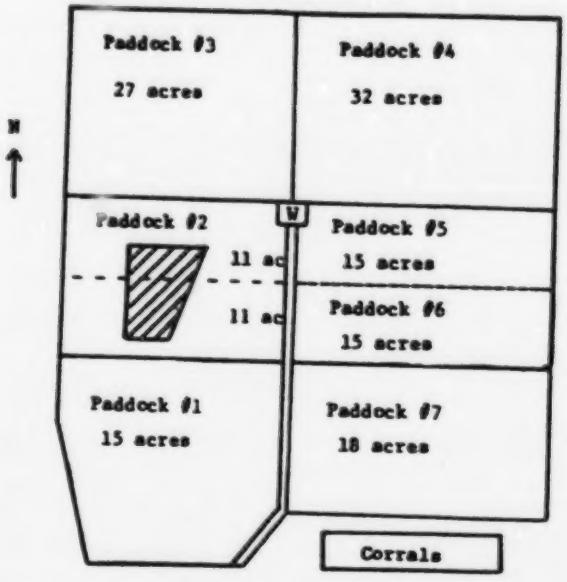
Site Plan:

NE: 11-13-10E

Soil Type:
Piney Fine Sand

Precipitation 13.5 inches

Frost Free Days 120



Paddocks 1 and 7 are seeded to grass only, mixtures of timothy, orchard and meadow fescue. Paddocks 2 to 6 are grass-legume mixtures of alfalfa, trefoil, timothy, orchard and meadow brome. The pasture was first seeded in 1979 and some selected paddocks have since been reseeded as of 1986. Half of paddock 6 was renovated and seeded in late spring of 1987.

Fertility:

The fertilizer is applied based on soil test recommendations and in 1987 all paddocks were fertilized with kg/ha: P:34, K:19. Grass-legume pastures receive 60 kg/ha of nitrogen and the grass only paddocks up to 100 kg/ha of N. The average for 1987 was 88 kg/ha of nitrogen for the pasture. The fertilizer cost for 1987 was $29 per acre.

Pasture Management:

A total of 144 head of cattle were stocked on 127 acres of pasture. These included replacement beef heifers, beef cows and calves and replacement dairy heifers.

The grazing schedule was on the basis of rate of forage growth, that is, the animals were moved between paddocks at a faster rate during fast growth periods and at a slow rate during slow forage growth. Due to some additional evaluation projects, however, on some of the paddocks, scheduled rest periods were not followed until the later part of July.

Livestock Management:

All cattle were vaccinated at pasture turnout with eight-way vaccine and tagged with fly tags or with fly tapes placed over existing tags. The beef heifers were involved in a horse fly control project with one group being sprayed every two weeks with a Permethrin spray, Ectiban, the other group unsprayed as a control.

The dairy heifers were supplemented with 3-4 lbs. of oats daily starting in early August to ensure adequate growth.

The beef heifers were all bred by A.I. They were checked to determine if they were cycling, and then injected with Lutylase and again 11 days later. They were then bred by A.I. 75 to 80 hours later. The cost of the Lutylase per head was $38.68 (2 doses) and $2.00 per head for the Vet. costs for a total of $15.68 per head.

A polled Hereford bull was used for clean up on those beef heifers that did conceive to the A.I.

Results:

As a result of the precipitation during July and August, the cattle were not able to keep up to the excellent growing conditions. The pasture was stocked with 144 head as indicated on Table 2. This stocking rate was equivalent to 780 lbs. of liveweight per acre.

The beef were on pasture until October 15th while the dairy were on pasture until October 30th.

Table 2:
1987 Pasture Production Seven Sisters Grassland Project

	No. Head	Pasture Initial	Wt.(lbs) Final	Avg.Daily Gain(lbs)	Gain /Head	Gain Total
Beef Heifers	56	751	1005	1.90	254	14,224
Beef Cows	25	1145	1330	1.38	185	4,645
Beef Calves	25	267	635	2.59	368	9,200
Dairy Heifers	38	511	811	2.11	300	11,400
	144					39,449

The pasture used was 127 acres and the gain per acre was 310 lbs. The estimated value of the gain at current livestock prices was $249 per acre (cows $50/cwt, calves $1.10/cwt, heifers $75/cwt).

The grazing schedule resulted in an average of 87 animal days per acre as is indicated in Table 3.

Table 3. Animal Grazing Days Per Acre

Paddock	#1	#2	#3	#4	#5	#6	#7	Avg.
Animal days/acre	120	79	74	52	149	18	122	87
Grazing days/pad.	55	44	45	40	52	4	89	

Note: Paddock #6 was renovated and reseeded in 1987.

The pasture was subdivided using high tension electrified wire. This was easily set up using fibre glass posts every 60 feet. In 1988, the 144 acres will be further subdivided to 12 paddocks of approximately 12 acres each so as to give better cattle control.

Beef Heifer Synchronization Results:

On September 24th the heifers were pregnancy checked and the following observations were made:

29 heifers in calf 3.5 months or more	52%
13 heifers in calf 3.0 months	23%
12 heifers in calf less than 3.0 months	21%
2 open heifers	4%

If it is assumed that 52% conceived from A.I. then that cost, excluding the semen, was $30.77 per heifer. However, an accurate indication of the results of the synchronization and conception by A.I. cannot be made until calving. Synchronizing and breeding by A.I. the top of a herd to high performing bulls can be a very practical alternative to a beef producer for herd improvement.

Pasture Profitability:

Animal performance can be used as a reliable indicator of the profitability of a pasture.

Expenses:	Per Acre	Total
Fertilizer	$ 29.00	$ 3,683
Livestock Expenses		
- health	2.00	244
- feed: grain - $912	9.00	1,192
mineral - $280		
Overhead		
- rent, forage establishment	22.00	2,794
	$ 62.00	$ 7,913

Revenue:		
Estimated value of production:		
- beef heifers 14,224 lbs @ $75/cwt		$ 10,668
- beef cows 4,625 lbs @ $50/cwt		2,312
- beef calves 9,200 lbs @ $110/cwt		10,120
- dairy heifers 11,400 lbs @ $75/cwt		8,550
	$249.00	$31,650
Net return to labor & investment:	$187.00	$23,737

Several other forage-livestock projects were conducted at the Seven Sisters project this summer. They included the following:

Horse Fly Evaluation Project:

This was an Agri-Food project in cooperation with the Entomology Department of the University of Manitoba. The objective was to evaluate some horse fly control pesticides, the behavior of the flies and the cattle when under attack.

The beef heifers were divided into two groups and used in this project.

Hay Preservation Projects:

These included the construction of a hay drying facility using a bin dryer fan to dry down stacks of high moisture hay. Proprionic acid was also used in another project to evaluate the potential of a buffered acid to preserve high moisture hay.

Forage Species Evaluations:

The recommended forage species of both grasses and legumes were evaluated in a plot located at the project site.

Summary of Pasture Management

The recipe for the most profit to a pasture can be summarized as follows:

1. Use productive pasture forage species, particularly grasses that have the potential for regrowth and hardy forage legumes.

2. Apply fertility according to the soil test recommendations but appropriate to the stocking rate that will be used.

3. Subdivide the pastures to ensure the survival of productive forage species by allowing a rest period between grazing periods. A minimum rest period of 30 days is required for most forage legumes and the grazing period should be short enough so that plants will not be regrazed during a grazing period.

   The number of paddocks per grazing area is determined by:

   $$\frac{\text{Resting days}}{\text{Grazing days}} + 1 \qquad \text{eg: } \frac{30 \text{ days rest}}{3 \text{ days}} + 1 = 11 \text{ Paddocks}$$

   Similarly the length of the grazing period is determined by:

   $$\frac{\text{Resting days}}{\text{\# Paddocks} - 1} \qquad \text{eg: } \frac{30 \text{ days}}{11 - 1} = 3 \text{ days grazing}$$

4. Adjust stocking rates to the potential annual forage production. This may have to be on the basis of previous carrying capacity or an estimate of the forage yield and will vary depending on the growing conditions.

5. Practice good livestock management to insure adequate livestock gains. Vaccinate to Vet.'s recommendation, use an effective fly control program and use growth promotants were possible.

6. Keep accurate records of pasture rotation so as to be able to determine grazing days per acre for each paddock. Also maintain financial records to determine pasture profitability.

EASTERN GRASSLAND SOCIETY - BEEF HEIFER REPLACEMENT DEMONSTRATION, 1987
(al:r95)

Name:	Heifer #	tt	Birth	Breed	Winter Gain 12/16/86	5/11/87	AVDG	Pasture Gain 6/ 1/87	6/15	6/29	7/13	10/13	AVDG	Preg. check Sept 24th
K. Blocker	74	98 13	2/17/86	H	601	805	1.40	785	807	847	882	1040	1.90	4.0 mos
	12	57 11	3/ 1/86	H	546	763	1.49	765	798	816	856	992	1.69	2.5 mos
	71	24	3/11/86	H	530	794	1.81	768	836	842	864	1000	1.73	3.0 mos
	57	33	3/19/86	H	504	671	1.15	658	697	719	744	884	1.69	4.0 mos
	41	7	4/ 8/86	H	524	763	1.64	752	792	809	829	1005	1.89	4.5 mos
B. Blocker	58	64	2/28/86	H	508	713	1.40	702	750	739	798	926	1.67	3.0 mos
	13	61 48	3/ 1/86	H	537	732	1.34	728	772	827	838	1014	2.13	3.5 mos
		54 67	4/ 3/86	H	455	671	1.48	647	717	730	763	935	2.15	4.0 mos
A.Coates	200	97 17		SIM	642	917	1.88	889	928	988	1045	1194	2.28	60 days
	25	44 3		SIM	598	816	1.49	798	853	867	909	1043	1.83	3.5 mos
O. Kominski		26 16	2/22/86	Char	702	882	1.23	876	941	942	1016	1142	1.99	3.5 mos
	90	14	2/ 3/86	Char	678	853	1.20	779	825	836	911	1054	2.05	60 days
	42	12	2/ 4/86	Char	728	913	1.27	891	950	972	1003	1175	2.12	4.5 mos
	92	62 9	3/27/86	Char	638	880	1.66	856	913	979	1003	1190	2.49	60 days
	93	31 18	2/26/86	Char	631	840	1.43	832	880	906	950	1091	1.93	60 days
Art Ferchuk	29	42	3/ 3/86	SIM	541	757	1.48	752	794	829	840	1038	2.13	4.5 mos
	761	12	4/27/86	SIM	603	790	1.28	783	849	851	889	1098	2.35	3.0 mos
	715	95 26	4/14/86	SIM	480	891	1.58	708	730	765	778	970	1.96	3.0 mos
	64	68	3/18/86	SIM	453	735	1.93	728	792	781	829	1000	2.03	3.0 mos
R. Nichol	70	34	6/ 3/86	GELB	473	833	1.10	820	858	871	886	836	1.61	3.0 mos
	71	60 4	4/ 1/86	CHxH	488	910	2.89	880	961	955	1076	1109	1.71	3.5 mos
	60	49	4/12/86	CHxH	658	811	1.05	796	836	845	873	1029	1.74	4.5 mos
	69	43	5/14/86	SHRT	484	697	1.46	686	715	735	761	911	1.68	3.0 mos
D. Nichol	67	38 38	4/18/86	SIM	506	695	1.29	675	715	750	759	919	1.82	4.5 mos
	68	49 21	4/ 9/86	CHAR	574	765	1.31	763	794	832	856	1005	1.81	3.5 mos
	61	22	4/11/86	CHAR	649	884	1.61	880	930	946	983	1142	1.96	3.0 mos
Norm Lussier		43 5	2/17/86	SIM	653	895	1.65	904	966	981	1012	1190	2.13	4.0 mos
	44	19	2/13/86	SIM	660	831	1.17	838	904	948	985	1149	2.32	3.0 mos
	111	77 1	3/ 1/86	SIM	691	908	1.49	920	986	972	1018	1177	1.92	4.5 mos
	65	100 28	3/13/86	SIM	618	718	.68	750			785	970	1.64	30 days
	36	36 6	3/ 2/86	SIM	647	891	1.67	897	974	979	992	1139	1.81	4.5 mos
Les Kurbis	31	53	1/20/86	ANxSm	691	860	1.16	875	911	939	979	1153	2.07	60 days
	79		1/ 4/86	ANxSm	625	820	1.34	805	840	873	911	1069	1.97	4.5 mos
		35	3/22/86	ANxSm	541	735	1.33	730	746	781	805	990	1.94	4.5 mos
	30	27	1/19/86	SIM	581	783	1.52	708	750	781	807	948	1.78	open
	39	39	4/ 1/86	SIM	539	759	1.51	746	794	829	834	1049	2.26	40 days
W.Proceviat	492	63	3/16/86	RAxH	585	704	.81	702	748	761	792	926	1.67	4.0 mos
	493	68 47	4/16/86	RAxH	488	888	1.37	895	750	748	779	959	1.97	4.0 mos
	494	99 37	4/19/86	RAxH	493	858	1.13	831	873	886	728	851	1.64	4.0 mos
	495	66 46	4/ 4/86	RAxH	528	713	1.27	724	722	763	792	923	1.49	4.0 mos
	464	96 23	4/18/86	RAxH	491	864	1.19	684	891	719	733	880	1.61	3.0 mos
B. Proceviat	497	70 29	4/28/86	RAxH	473	816	.98	827	862	700	728	920	2.19	open
	498	51 31	3/30/86	RAxH	528	877	1.02	884	708	724	757	900	1.76	4.0 mos
	499	99 32	3/26/86	RAxH	537	770	1.60	739	774	818	829	1000	1.95	4.0 mos
	500	78 39	3/22/86	RAxH	554	757	1.39	742	781	807	840	988	1.84	3.5 mos
	25	41	3/23/86	RAxH	552	788	1.48	741	799	788	832	986	1.84	3.5 mos
Alan Aime	6U	27	3/13/86	PH	475	651	1.20	638	684	688	739	858	1.64	3.0 mos
	8U	59	3/14/86	PH	466	673	1.42	660	697	717	730	871	1.57	3.5 mos
	10U	34	3/16/86	PH	504	719	1.47	704	739	759	783	862	1.18	40 days
	18U	18	3/30/86	PH	480	829	1.02	825	855	871	897	1000	2.80	3.0 mos
	24U	39	5/ 1/86	PH	438	668	1.56	666	688	735	768	898	1.73	40 days
L. Sikora	45	59 61	3/ 8/86	CHxH	543	713	1.16	695	737	732	785	948	1.89	3.5 mos
	27	48 36	3/ 9/86	CHxH	537	765	1.58	781	820	799	847	992	1.72	3.0 mos
	78	92 2	3/ 7/86	CHxH	552	761	1.43	761	816	847	862	955	1.45	60 days
		46 62	3/24/86	CHxH	493	693	1.37	664	704	730	761	906	1.81	60 days
	84	8	3/ 5/86	CHxH	583	796	1.48	776	822	858	889	1076	2.24	4.5 mos
					558	762	1.40	751	801	816	858	1,005	1.90	
				Hereford Bulls:				1067	1078	1058	1056			

Note:
The heifers were bred by A.I. on a timed breeding program using Lutylase to synchronize heat.
Two Polled Hereford yearling bulls were used as clean up bulls for the two groups of heifers.
These heifers were on pasture as of late May and divided into two spray groups as of June 1st.
The spray treatments involved the use of a Permethrin spray to evaluate the effectiveness for Horse Fly control
The heifers were rotationally grazed between two paddocks to remove any paddock effect on the animals.
The fly project was completed on July 13 1987 and the heifers grazed as one group with the cow herd.
The heifers were pregnancy checked on Sept.24th and returned home October 15th

EASTERN GRASSLAND SOCIETY - BEEF HERD GRAZING MANAGEMENT 1987

	Cow Number		Weight 6/ 1	10/13	AVDG	Calf number		Birth date	Weight - wt.	6/ 1	10/13	AVDG W/D/age	Cow Efficiency	Pregnancy Check
Norm Lussier	8	24	1454	1531	.57	29	24	2/10	85	358	697	2.50	33%	4.0 mos
Lac du Bonnet	9	16	1091	1370	2.08	218		2/10	100	391	717	2.52	37%	3.5 mos
	20	39	1318	1472	1.15	52	39	2/17	88	338	719	2.65	36%	4.5 mos
	21	42	1197	1361	1.37	89	42	2/20	100	358	699	2.55	37%	4.0 mos
	4	34	1481	1681	1.84	97	34	2/28	105	387	814	3.12	37%	4.0 mos
Gordon Otto	100	100	776	1016	1.79	50	40	4/25	83	156	468	2.25	44%	3.5 mos
Beausejour	11	46	915	1014	.74	22	46	4/20	78	134	537	2.61	51%	3.0 mos
	98	98	970	1100	.97	46	25	5/ 2	74	130	464	2.38	43%	3.5 mos
		94	783	926	1.07	56	44	4/ 3	80	198	600	2.69	58%	40 days
	10	95	878	1029	1.13	45	28	3/30	88	147	532	2.28	44%	2.5 mos
O. Kaminski	46	46	1117	1250	.99	46		4/ 4	84	235	614	2.78	44%	4.5 mos
Beausejour	47	17	1115	1406	2.17	6	37	3/11	89	279	666	2.67	38%	3.5 mos
	48	1	1080	1368	2.13	30	34	4/14	92	231	614	2.87	42%	4.5 mos
	49	14	1241	1476	1.75	38	39	3/18	95	270	636	2.59	35%	4.5 mos
	50		1562	1674	.84	49	708	2/28	95	328	704	2.68	32%	4.5 mos
T. Kaminski	41	13	1140	1340	1.49	23	31	3/19	100	328	744	3.10	46%	3.0 mos
Beausejour	42	45	1232	1445	1.59	29	33	3/ 5	90	295	638	2.47	34%	4.0 mos
	43	15	1322	1621	2.23	32	28	3/ 8	92	277	675	2.68	33%	4.5 mos
	44	5	1078	1280	1.61	24	29	4/17	88	215	539	2.53	40%	3.0 mos
	45	12	1403	1606	1.51	27	30	3/14	98	352	790	3.28	41%	4.0 mos
Brian Proceviat	13	6	981	1104	1.07	51	15	1/20	75	321	847	2.15	39%	4.5 mos
Elma	12	2	1076	1245	1.28	53	8	2/28	75	279	625	2.42	39%	4.5 mos
	11	18	1247	1324	.57	52	7	3/10	75	312	847	2.64	40%	60 days
	10	18	1126	1280	1.15	54	5	3/20	75	198	559	2.34	37%	2.5 mos
	9	7	1087	1320	1.74	55	4	3/15	75	189	535	2.17	33%	4.5 mos
			1,145	1,330	1.38				87	287	635	2.59		

Note: Cow efficiency is calf weight corrected to 200 days as a % of cow weight

Forage Management Demonstrations

Forage management demonstrations involved the comparison of several annual forages as cover crops for establishing forage crops and the establishment of two sites to evaluate the adaptability of some new varieties of grasses to marginal soil areas of the Region.

Cover Crops for Forage Establishment

The use of a cover crop to establish a forage crop is an accepted practise in the Eastern Region. The benefits of a cover crop in providing an economic return in the establishment year and the competition which results in reduced germination of weed seeds, is sometimes greater than any loss in production from the competiton of the cover crop to the establishing forage.

Attempts to establish alfalfa without a cover crop usually results in excessive weed growth unless timely weed control measures are used. Herbicides that can be used on alfalfa-grass mixtures are very limited. However, producers are always looking for a cover crop combination that will maximize production in the seedling year but not compete excessively with the establishing forage.

Susan Meszaros, who manages Meadolamb farm, a 450 ewe sheep farm at Dufresne, evaluated some different cover crops last year when establishing a 22 acre field of alfalfa.

The field was seeded to Citation alfalfa and timothy at 8 lbs per acre on June 6th, 1987. The cover crops used were Italian rye grass, Shafto annual clover, and Annual alfalfa. Each was seeded in seperate strips with the objective to harvest each for forage in the establishment year and compare the relative advantage of each as a cover crop.

The annual clover and annual alfalfa were used as there was some indication that these species were more aggressive than the perennials and perhaps would reduce the germination of weed seeds. Each crop was seeded in strips in the field so that they could be harvested separately. The annual clover and alfalfa were seeded at 6 lbs per acre and the annual ryegrass at 9 lbs per acre.

The germination of all annuals was good but early growth was restricted by hot dry weather with the exception of the mustard and other weeds. This first flush of weeds was cut in mid July at which time the annuals and alfalfa were also about 20 inches high and starting to bloom. The regrowth was harvested in mid September after a killing frost. As the moisture was high and there was poor drying weather, the forage was baled and then wrapped and ammoniated using the Injector-wrap equipment.

Yield and Analysis of Annual Forages for Cover Crops

Crop	DM %	lbs/acre	Protein	ADF	TDN
Annual Alf.(WM10)	66%	2276	21.3%	34.1%	62%
Annual Alf.(WM12)	73%	1748	20.9%	35.8%	61%
Shafto Clover	53%	1905	21.5%	31.9%	63%
Italian Rye grass	68%	2321	18.8%	35.2%	61%
Alfalfa (estab.)	62%		23.4%	26.9%	67%

Note: The yields are for the second cut only, harvested in Sept.

The analysis of the established alfalfa was from an adjoining field and was included for comparison.

Susan observed that the Shafto clover had very thick stems and as it grows close to the ground was very difficult to harvest. The annual alfalfa appeared to be similar to the perennial varieties but also had a thicker stalk. The annual alfalfa and clover did not appear to have any advantage over the perennial alfalfa as being any faster to establish and more competitive with weed growth than perennial alfalfa. The rye grass, however, was slow to establish in June but by late July had excellent regrowth and continued growing after several frosts.

"The use of annual rye grass with oats which does grow quickly in the spring may be the preferable cover crop combination for establishing alfalfa", observes Susan. "Alfalfa is not aggressive enough in our productive soils to suppress weed growth by itself and as we are very concerned about herbicide residues in the forage used in our sheep operation, this ryegrass-oats mixture may be our best alternative".

Forage Crop Management Demonstrations were established at two locations this year to evaluate some of the new varieties of Reed Canary grass and Meadow Brome grass suited to some of the marginal soil areas compared to standard mixtures for hay production.

Roy Nichol of River Hills established 23 acres seeded to 5 different forage mixtures on a marginal soil area. Mixtures included: Meadow Brome and Venture Reed Canary as well as forages such as timothy, orchard, alfalfa, alsike and trefoil.

Bernie Grycki of Garson, established a 15 acre field of forage in an area of poor drainage to a mixture which included Palaton and Venture Reed Canary grass with alfalfa and timothy. These demonstrations will be monitored in 1988.

W. Buss of River Hills had one forage demonstration comparing the forage yield of a mixture on peat soil and on mineral soil from the same field. The peat area was in a lower, wetter part of the field and for that reason it was impossible to apply fertilizer equally throughout.
The results from the mineral(9.4 acres) and the peat(27.5 acres) sections of the field were as follows.

Forage Yield(tons/acre-DM)	1st cut	2nd cut	Total
Peat	1.92	1.20	3.12
Mineral	2.40	2.00	4.40

Forage Species Evaluation:

To evaluate the adaptability of forage species to the Region, recommended alfalfa and grass species were seeded in 1986 in replicated plots each 3ft by 20ft at the Seven Sisters Grassland project. The project is located at NE 11-13-10E, the soil type is a Piney fine sandy loam class IV soil. Annual precipitation in 1987 was 12.8 inches (April-October).

Alfalfa Variety Evaluation - seeded May 1986

Variety	Tons Dry Matter per Acre					% of
	June 12	July 27	Sept 22	Total	1986	Avg.
Algonquin	2.54	1.63	1.36	5.53	1.51	104
Anchor	2.76	1.36	1.36	5.48	1.92	110
Angus	2.47	1.20	1.09	4.76	1.64	95
Apica	2.47	1.25	1.25	4.97	1.68	99
Beaver	2.18	1.25	1.09	4.52	1.92	95
Blazer	2.61	1.58	1.36	5.55	2.11	114
Citation	2.90	1.42	1.31	5.63	1.60	107
Drylander	2.40	1.47	0.82	4.69	1.50	92
Hunter	2.40	1.52	1.03	4.95	1.97	103
Pickstar	2.32	1.42	1.09	4.83	1.90	100
Rambler	2.61	1.09	0.76	4.46	1.92	95
Rangelander	2.69	1.36	0.87	4.92	2.02	103
Spreador II	2.98	1.36	1.09	5.43	2.05	111
Thor	2.90	1.42	1.47	5.79	1.73	112
Vernal	2.76	1.42	1.58	5.76	2.03	116
Vista	2.25	1.47	1.31	5.03	1.95	104
				5.15	1.58	

Note: 1986 yields were in the year of seeding.

Seven Sisters Forage Grass Evaluation - 1987

	Ton/acre	% of Avg.
Carlton Smooth Brome	2.82	130
Regar Meadow Brome	1.79	82
Boreal Cr.Red Fescue	1.50	69
Meadow Fescue	2.87	132
Mustang Tall Fescue	2.15	99
Meadow Foxtail	1.84	85
Kay Orchard	4.40	203
Altai Wild Rye	0.89	41
Russian Wild Rye	1.29	59
Climax Timothy	2.79	129
Ephrain Crested Wheat	1.50	69
Fairway Crested Wheat	1.44	66
Chief Int. Wheat	3.60	166
Slender Wheat	1.34	62
Common Tall Wheat	2.35	108
	2.17	

Note: There was considerable variation in these plots due to irregular plant populations. Yields should be considered with caution.

Orchard, Int. Wheat, M.Fescue, Brome and Timothy were the most productive of the **Hay Type** grasses.

Orchard, Timothy and M. Fescue the most productive of the **Pasture type** grasses. However, Meadow Brome and Meadow Foxtail appeared to be well adapted to the area.

High Moisture Forage Storage Demonstrations

Harvesting a quality forage is often difficult due to poor weather conditions particularly for making hay. Several methods of preserving quality forage were evaluated this year including: a) Injector Wrap system b) Natural air drying c) Proprionic acid. The following is a progress report of the experience with each system to date.

The **Injector Wrap** is the latest equipment available locally to preserve high moisture forage (above 30% moisture). This equipment will pick up a round bale, wrap it with plastic and inject anhydrous ammonia to prevent spoilage and to increase the feed value of the forage.

Six producers in the Eastern Region used this equipment which was custom operated by Kisiloski Bulk Fertilizer Co. at Beausejour. A total of 500 bales were wrapped shortly after baling by these producers who used it because of poor hay drying weather. The moisture content of the bales varied from 35% to 80% and the bale weights varied from 500 lbs to 1800 lbs.

Cooperator	Moisture%	Nh3 used	No. Bales
Bert Shumilak, E.Selkirk	60-70%	2%	39
Norm Lussier, Lac du Bonnet	35-40%	1.5%	16
Bob Watt, Ile Des Chene	20-70%	1.5%	275
John Johnson, E.Selkirk	66%	1.8%	34
Charlie Johnson, Lockport	70-80%	2%	29
Medolamb Farm, Dufresne	47-27%	2%	104

Not all bales have been fed out at this time, however, the initial reaction is quite favourable from most of the producers. There have been reports of mold and spoilage from some of the wetter bales and usually on the outer edges. This may either be due to a delay between the time of baling and wrapping or there may be a limitation as to the moisture level for this system. Some of the cooperators have suggested that the moisture content should be no greater than 45% and preferably less. The cost ranged from $8-$10 per bale. Most observed that the system did

preserve the feed which would have spoiled if left to be harvested later. The wetter bales had the appearance of silage and were readily accepted by the livestock. Most said they would use the system again as an emergency forage harvesting system.

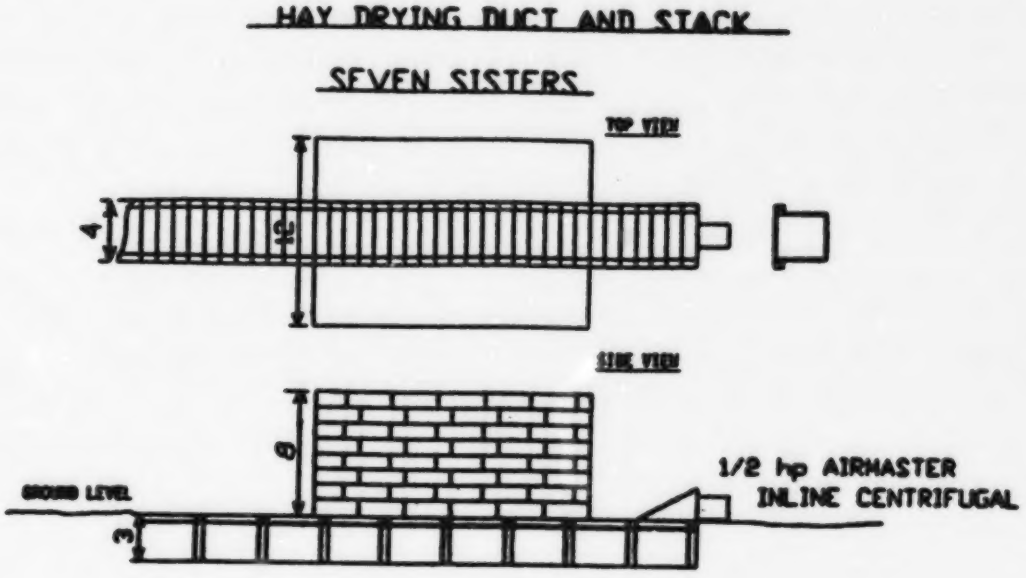
Forage Preservatives have been promoted for many years to improve the quality of hay with variable results. Silage inoculants which have been beneficial in making silage, have in recent years been promoted for use on hay. Forage research, however, has documented little evidence of any benefits for use on hay. The use of proprionic acid, however, as a method of preserving hay quality has been well documented. There has been a reluctance, however, for producers to use acids due to the caustic smell and effect on operators and equipment. Lately some formulations have been developed that are buffered to reduce the caustic properties and added the use of sweetners to offset the unpleasant odors. One product, Alfa-Save, was used on a limited basis last year at the Seven Sisters Grassland with some good results. Hay was harvested at 28-30% moisture and although there was some dustiness with the wetter bales, the acid did preserve the hay from spoilage. Additional trials will be conducted in 1988.

Lists of forage preservatives currently licensed for use in Canada are available from Man. Agric. Beausejour.

Hay Drying Demonstrations were conducted at the Seven Sisters Grassland project during the summer of 1987. The purpose was to determine some of the operating parameters such as air flow requirements, maximum moisture content, and drying times.

An in-ground air distribution duct was conducted in a 36"x36"x60' trench to provide the distribution system for the drying tests. This was done in order to accomodate mechanical loading with a bale wagon. The trench was reinforced with 2"x6" framing at 4' o.c. and 1/2" plywood sheathing. Railway ties were placed on each side of the duct so that the tops would support 2"x 8" planking at ground level. Planks were spaced at approximately 2" openings under the stacks. A 1/2 hp in-line

centrifugal Airmaster fan was mounted at one end of the duct at ground level and connected to the duct with a transition section.



Two demonstration tests were conducted. The first pile consisted of 300 bales at a composite moisture content of 24%. The stack was put up on June 24th and was 8 rows high. The fans were started as soon as the first bales were placed on the duct. Temperature probes were placed in the stack at eight different locations to provide a means of assessing air distribution. The stack was covered with black plastic extending only down on the sides of the top layers. On June 30th the data logger which was recording temperatures was struck by lightening and all the data was lost. The fans continued to operate until July 3rd at which time the composite moisture content of the pile was 18%. Air flow was 435 CFM/dried ton. The pile was removed on July 20th and the bales were examined for molds and spoilage. Bales were dusty with small amounts of mold only on the top layer which was sealed by the plastic. The balance of the bales were of good color and minimal dustiness.

The second stack was constructed on July 3/87 and covered July 6/87. It consisted of 225 bales with a wide range of

moisture contents all over 30% with the composite sample at 34%. The hay was rained on before harvest. During piling, four bales were tagged and temperature probes inserted. They then were placed at rows 3,4,5 and 6. Measured air flow was 580 CFM/dried ton. Drying continued for 28 days. Moisture content levels were reduced to 19%.

Results of the second trial indicated poor air disrtibution under the plastic, with temperatures remaining high at the top level for eight days (Fig.1). A significant amount of mold was present again in the top two layers where they were sealed by the plastic.

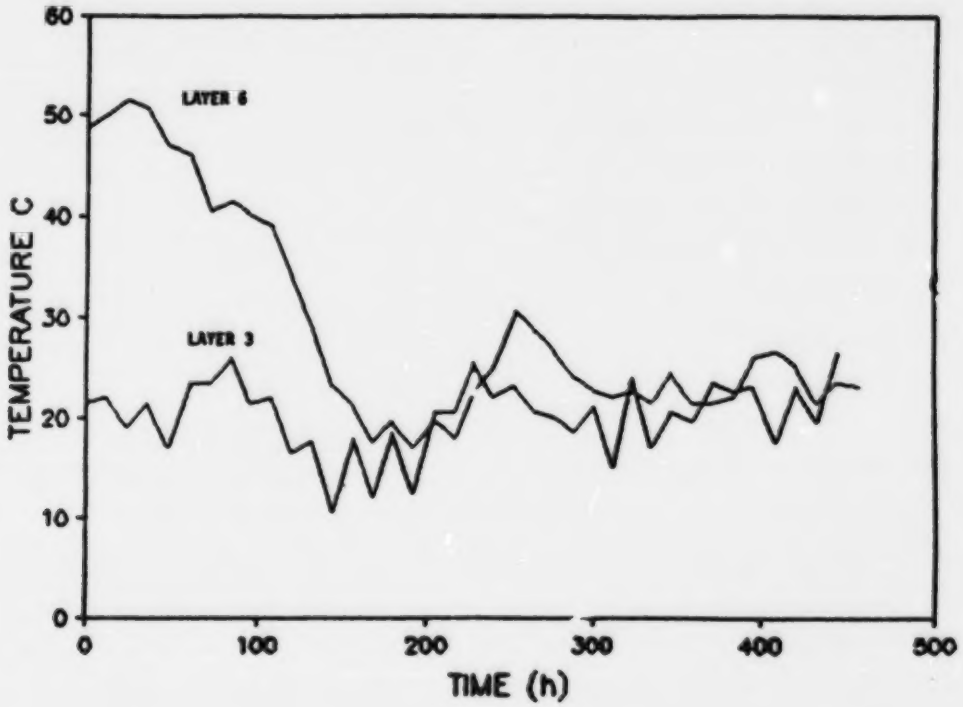


Fig.1

Second Stack

It recommended that this type of trial be continued. However, trials should be done using a hay shed or an alternative system of covering to prevent the high temperatures from persisting in the upper levels of the stack when covered with plastic.

It appears that the system constructed at Seven Sisters for artificial drying is practical for on-farm use. The total cost for construction of the duct and flooring was $400. In order to use the total length of the drying floor at one time a larger capacity fan is required.

Forage Marketing

Forage marketing is of considerable interest this year as the hay crop was above average. Hay supplies available for market are perhaps the largest on record in the Eastern Region due in part to the excellent hay crop of 1987 and the increased forage acreage. Some hay yields reported in the Beausejour area were in excess of 4 tons of hay per acre and feed tests this fall indicated some excellent quality. Manitoba Crop Insurance which monitors yields in the Region have indicated the following results for the Region (Table 1).

Table 1: Eastern Region Forage Yields 1987

Municipality	(Forage type)		Municipality	(Forage type)	
	Alfalfa	Alf-grass		Alfalfa	Alf-grass
Alexander		1.4 (92%)	Tache		2.2(124%)
Brokenhead	2.2 (129%)	2.0 (119%)	Desalab.	2.3 (126%)	2.4(137%)
Lac du B.	2.3 (154%)		Hanover	2.7 (131%)	2.5(148%)
Whitemouth		2.9 (154%)	Richot	2.3 (129%)	2.9(163%)
St Clements		1.9 (127%)	Franklin	2.7 (141%)	1.8(110%)
Springfield		1.7 (110%)	Stuartburn		1.5(113%)
Reynolds		1.4 (99%)	LaBroq.	2.7 (156%)	2.3(142%)
Ste Anne	2.8 (166%)		Piney	1.0 (64%)	1.3 (96%)
		Average Yield (t/acre):		2.3	2.0
		% of Normal Yield:		133%	124%

Note: **tonnes per acre at 88%DM**: Index (%),is the comparison as a percentage of the long term average yield. Yields are from Manitoba Crop Insurance annual field survey of forage yields on selected test fields.

Many hay growers who were considering hay as a potential cash crop have found the market this year very tight. In December 1987, the Manitoba Agriculture hay list in the Eastern region had an estimated 17,000 tons of hay for sale of which 70% was round bales and 30% as square bales. This hay list was distributed to all feed and hay dealers in the Region as well as selected County Agents in Minnesota and Wisconsin where there was a shortage due to a drought in 1987 and to Saskatchewan. This listing was

available to hay growers at no charge through the local Ag. Rep. office.

Hay is currently being moved from the region to markets in Thunder Bay, U.S. and Saskatchewan. In Minnesota and Wisconsin hay auctions have indicated prices of $90-95 (US) per ton for hay of 20% protein and ADF of 35%. Only top quality hay of square bales is suited to this market. All hay at these auctions is feed tested on site by the use of the NIR analysis and sales are based on this quality analysis.

There is potential in other distant markets for good quality hay. A green color, high quality hay is essential for these markets plus good bale density to keep down the transportation costs. However, it may be necessary to consider other methods of increasing the forage density for distant markets from the standard 15 lbs/ft3 for the small square bale to 25 lbs/ft3 for compacted bales or to consider cubing at 30-35lbs/ft3 to reduce transportation costs.

Activities of the Eastern Grassland Society in hay marketing for 1987 have included the investigation of potential hay markets for horses in Florida, the potential of a bale compacter and the feasability of alfalfa cubes for marketing surplus hay.

Cattle Management Demonstrations

Demonstrations have included activities such as feed testing and ration formulation, cattle identification by the use of brisket tags and the promotion of A.I. by the use of heat synchronization.

Brisket Tags such as the "Life of Cow" tags and the tags sold by U.G.G. are being used by several producers. The "Life of Cow" tags require a 3/8" hole to be drilled or punched through the brisket. The animal needs to be well restrained which appears to cause more discomfort than inserting the tag which also must be glued together with a special bonding glue. The U.G.G. tag requires a smaller hole but there have been reports of them being pulled out as the wire hook can catch on obstacles.

The brisket tags will be a definite advantage if they last longer than most ear tags. They are very easy to see.

Synchronizing Beef Females Assists an A.I. Program

Some of the major obstacles to beef producers who would like to use artificial insemination in the beef herd is the problem of identifying animals in heat and obtaining a reasonable conception rate. It is possible to make very rapid improvements in the herd if a practical on farm A.I. system can be implemented.

Heat synchronization is a technique where using a hormone (prostaglandin) such as Estrumate or Lutalyse, the normally cycling female can be brought into heat within a specific time period. The female then can be bred at the optimum time, thus eliminating heat detection guess work. Breeding can be done naturally, allowing the use of a superior bull on more females, or by the use of A.I.

The use of heat synchronization is being adopted by beef herds where A.I. is used, particularly for breeding the top producing cows of the herd to superior sires. These seed stock females, which may be only 20% of the total herd, have the best potential for use of A.I.

A shortened calving period is another benefit of the technique as well as improved A.I. conception rates as the breeding period can be within a 10 day period or less.

Some beef producers have found that synchronizing groups of 20 females make it possible for the producer to handle the breeding and the calving himself. Larger groups are possible if additional help is available.

Beef heifers at the Seven Sisters Grassland project were bred this spring after being synchronized, the objective being to reduce the breeding period in the spring and to be able to use several superior A.I. sires. Cycling heifers were given two injections of Lutalyse 11 days apart. The heifers were then bred 75-80 hours after the initial injection. Lutalyse cost per head was $13.68 (two injections) and $2.00 per head for the Vet. to check the heifers for cycling for a total cost of $15.68 per head. Semen was obtained through PPP as all the cooperators involved were enrolled on R.O.P.

On Sept 24th, the heifers were pregnancy checked and it was estimated that at least 52% of the heifers conceived from A.I. and the balance due to the clean up bull. A more accurate indication of the conception, due to this program, will be made at calving. To evaluate the actual cost per conceived heifer, at 52%, the cost of the hormone and the Vet. was $30.77 per heifer.

Another system of synchronization is the 10 day program. For the first five days any animal showing heat is bred. On the 6th day, the balance of the females are injected with a prostaglandin hormone and again all those showing heat are bred in the next five days. All females must be cycling to respond to this or any synchronization system. This is a lower cost system as it involves only one injection of the prostaglandin hormone instead of two, however cows must first be observed for heat detection.

Identification of females in heat is best done late in the evening or very early in the morning. On the ten day program checking the herd will only be done for this time period. Heat detection can also be assisted by the use of a gomer bull or androginzed female. A gomer bull can be altered for this purpose at an approximate cost of $70 and a gomer female for $25.

Several of the cooperating beef producers at Seven Sisters have also tried synchronizing some of their beef herd with the following observations.

Norman Lussier of Lac du Bonnet used the single injection of Lutalyse on 10 heifers and A.I. bred on observed heat. When preg. checking this fall, he believes that as high as nine out of ten could be pregnanat from the A.I. He has been using the synchronizing drugs for a few years and finds that they have helped him to reduce the calving period to 60 days and also the amount of time he has to spend on his breeding program. It also helped him to breed his heifers earlier than his cow herd. Conception rates on his females have averaged 70% using A.I.

Art Ferchuk of Lac du Bonnet injected 16 heifers with the two injection Lutalyse system this spring, breeding 75-80 hours after the second injection. On preg. checking this fall, 13 of the 16 appeared to have conceived to the A.I. The use of A.I. is how he obtains the use of superior sires and as time is very limited in the spring due to seeding and other crop work.

Roy Nichol of Seven Sisters A.I. bred 12 cows 75-80 hours after the second injection with Lutylase. Preg checking results sugtgest all the heifers conceived.

Les Kurbis of Beausejour A.I. bred 11 heifers 75-80 hours after two injections with Lutylase. The heifers had been previously checked to determine those cycling. Some had been observed in heat and the balance were identified by the Vet. as beginning to cycle. On preg. checking this fall he identified six that likely conceived to A.I. (54%) as a result of this technique. The heifers that he had previously observed cycling all concevied and the questionable ones were those just starting to cycle.

Conrad Caya of Great Falls has used this technique for two years with the assistance of Dr. John Copps of Lac du Bonnet. The results of this experience has convinced him of the benefit of introducing superior sires into his herd at a reasonable cost using A.I. The synchronization program has made possible a practical efficient method of using A.I. on his farm, especially at the very hectic spring planting time.

Assistance for this demonstration was obtained from Tuco Products Co. and from the Agro-Food demonstration program.

Biting Fly Research Project

In June of 1986, a joint research project was initiated with the University of Manitoba and the Eastern Grassland Society to evaluate methods of controlling Horse Flies on cattle on pasture. This project was funded under the Agri-Food program.

Dr. Terry Galloway of the University of Manitoba and his graduate student Paul McElligott are investigating the effects of the biting flies on cattle and the effect of some insecticides as potential control measures.

At the Seven Sisters Grassland project, using some of the beef heifers at the site, research trials were conducted in 1986 and 1987.

In 1987, 56 beef heifers were separated into two equal groups and grazed on separate pastures. They were rotationally grazed between pastures to eliminate any difference in pasture quality between treatments. One group was sprayed every two weeks with a Permethrin spray, while the other group was left unsprayed as a control.

The heifers were closely monitored to observe behaviour changes as a result of the spray as well as any differences in weight gains. By holding flies on the backs of the animals the effect of the insecticide could also be recorded. Monitoring the fly populations also provided some idea of the severity of the flies at the Seven Sisters site.

Observations to Date:

1. Animals herd together when under severe fly attack in a consistent pattern to try to lessen the impact of the flies. They try to maintain as much contact with other animals as possible. This results in a grazing line where all but the end animals are flanked by another. The herd moves across the pasture at a rate relevant to the intensity of the fly pressure.

2. Animals draw into compact groups with the center of the group offering the greatest protection. As the animals on the outside try for the middle, there is a pot-boiling effect with a great deal of energy spent working to the middle.

3. Under continous fly attack and high temperatures, the weaker animals lie down, appear exhausted and submit to the onslaught of the flies.

4. The losses on pasture to extreme fly pressure occurs not only to the stress of the biting insects, but also due to the heat stress under high temperatures as a result of the crowding together of the animals.

5. There is obviously a potential weight loss from excessive fly pressure due to loss of time available to graze. Some of this lost time may be compensated by night grazing but this may be very limited.

Results of 1987 Project:

1. The heifers which were split into two groups indicated a 12% advantage to the sprayed group at the weigh period taken June 15-29th which was the period of highest fly populations. At this time, fly collection was up to 2400 horse flies from the traps in a 12 hour collection period, an indication of the extreme fly pressure the animals were exposed to at this time. The average from May 31 to June 15 was approximately 2000 horse flies per 24 hour period. The fly season ended this year at approximately the second week in July.

2. There was a definite difference in grazing habits between treated and control heifers, the sprayed heifers grazed in a random normal fashion with minmimal aggravation, while the unsprayed heifers grazed in a close tight line showing considerable discomfort from the flies.

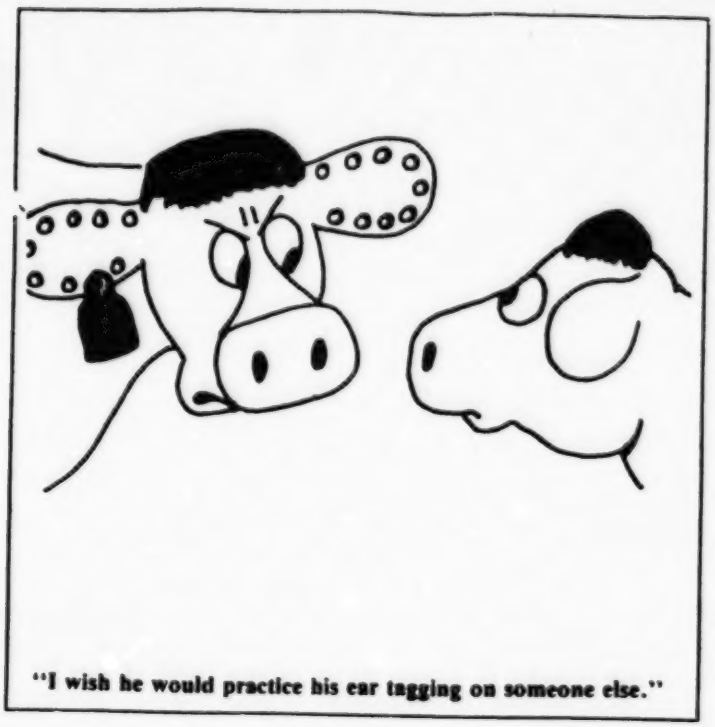
3. There was no apparent difference between treated and control heifers at the end of treatment period on July 13th likely due to compensatory gain after the fly pressure was reduced.

4. The spray was still 100% effective seven days after spraying as determined by the bio-assay evaluation.

5. Approximately 16 Horse Fly species were identified . Some species populations peaked at different times of the season. Some species were active all day, while others only at specific times.

Temperature had an effect on fly activity, but varied with species. Wind speed did not influence horse fly activity.

Next year the project will investigate the effect of two other insecticides and their residual effect. The effect of light intensity and temperature will also be monitored.



"I wish he would practice his ear tagging on someone else."

Replacement Dairy Heifer Demonstration 1987-88

The rearing of replacement dairy heifers is an important aspect of a dairy operation because it affects the future profitability of the herd. A project to identify and demonstrate some of the more important aspects of heifer replacements is being conducted at the Seven Sisters Grassland project using productive pastures and high quality forage for raising heifers.

The Seven Sisters Grassland project is located three kms north and two kms west of the junction of PTH 44 and 11. The 144 acre pasture project is sponsored by Manitoba Agriculture and the Eastern Grassland Society. Participating dairy producers supply the heifers and pay a portion of the feed costs while the MDA pay the other costs.

Production Goals:

Heifers should be raised to freshen at 24-25 months of age. It has been estimated that there is a minimum loss of $4 per day in terms of lost milk sales and extra feed and labor costs associated with delay beyond this stage. Some weight and frame size objectives are as follows:

Age	Weight(lbs)	Height(inches)
6 months	400	43
14-16 months	830	52
24 months	1150-1270	56

To accomplish these objectives requires the selection of a replacement female that has the genetic potential for growth and the provision of adequate nutrition for her growth and development.

Seven Sisters Grassland Project

The objective of the dairy heifer replacement project at Seven Sisters is to evaluate the use of quality forage in the form of pasture and hay, in the diets of replacement heifers and to demonstrate some of the other associated management factors required to produce a replacement heifer freshening at 24 months of age.

At Seven Sisters, dairy heifers are brought to the pasture in June at approximately 6 to 8 months of age, raised on pasture, bred by A.I. from Nov.to Jan., and returned home after the pasture season in August prior to freshening.

The pasture program involves the use of productive pasture species of grasses and legumes. Grass species used are timothy, orchard, and meadow fescue, while legumes used are alfalfa and trefoil.

The pasture is fertilized according to soil test recommendations. The soil is a Piney fine sand so the fertilizer applied requires the application of N,P and K. In 1987 the cost of the applied fertilizer was $29 per acre.

Cross fencing is used to maintain the productive forage species by allowing for rest periods to avoid overgrazing. The stocking rate for the dairy heifers is approximatley 1 to 2 animals per acre (750-1000 lbs liveweight). Heifers are also supplemented with 3-4 lbs of oats daily, starting in early August, to supplement any loss of pasture quality in the latter part of the season. Copper supplemented mineral is fed free choice with loose salt. The ratio of Ca.to Phos. in the mineral varies according to the amount of legume in the pasture. A pasture with 30% legume, a 1-1 mineral will be used and a 2-1 mineral for a grass only pasture.

Typical performance of the dairy heifers on this pasture is as follows:

Performance of Dairy Heifers on Pasture at Seven Sisters

Year	Rainfall	No.Head	Gain	AVDG
1987	12.8 inches	38	300	2.11
1986	16.5 inches	37	250	1.69
1985	14.3 inches	36	209	1.85
1984	13.5 inches	40	193	1.55
1983	10.5 inches	40	176	1.53

The winter feeding period involves the use of high quality forage plus 5 to 6 lbs of grain daily to ensure proper cycling of the heifers. The use of a high quality forage is of particular

importance and the use of a feed test to determine that quality. Fiber in the forage is an important factor as it will determine intake and utilization by the heifers.

An example of this difference is seen in these results of a feeding trial at Seven Sisters with two types of alfalfa-grass hay.

Effect of quality forage on growing heifers

Analysis of Forage:	1985-86	1986-87
Protein	23%	16.6%
Fiber (ADF)	36%	49.7%
TDN (est.)	60%	56%
Animal performance:		
Avg. daiy gain	1.72 lbs	1.06 lbs

The major difference in performance is more likely due to the fiber (ADF) level. High fiber forage results in poor utilization by the animal and excessive waste. With poor quality hay additional grain is also required for the heifers to achieve their goal of 65% of mature weight at breeding.

The forage currently being used this winter has the following average analysis:

Protein: 18% C.Fiber(ADF) 30-33% TDN 63-64%

In young stock, high protein (22%) and low fiber (32% ADF) may cause some scouring and a lower protein forage (15-18%) with a fiber level of 35% ADF may be preferable.

Performance of Replacement Dairy Heifers 1987:

		Initial (lbs)	Final (lbs)	AVDG (lbs)	Height (inches)
Pasture:	June 1st-Aug 5th	511	640	1.99	44.64
	Aug 5th-Oct 22nd	640	811	2.19	48.60
Winter:	Nov.-Dec.	811	910	1.75	

Herd Health:

The health of the replacement heifer is as important as nutrition and a recommended preventative herd health program from your local Veterinarian is the key.

The heifers on this project were vaccinated at pasture turnout for blackleg, fly tagged and dewormed with a Paratec bolus. In the fall they were vaccinated again for blackleg and Triangle 3 and treated with Ivomec.

The worm counts on the heifers on June 2nd identified 22 out of 38 with worms. The worm counts on Oct 22nd identified 18 out of 38 heifers with worms. How critical this worm factor is in our climate is a debatable factor and perhaps deserves further study.

Breeding:

The breeding of heifers in the winter is more difficult than in the spring or summer due to the heifers being less active and more difficult to identify in heat. The use of synchronizing drugs have also been a valuable tool to coordinate breeding. One trial at Seven Sisters using a timed breeding program resulted in 68% conception on the first service with 27% on the second.

This winter 80% of the heifers have conceived on first service likely due to the warm weather and the use of high quality forage. The heifers were also checked in the early AM and late PM to identify those in heat which is the key to success.

Following breeding the nutrition of the heifers should be checked to ensure continued growth but not fat deposit.

Charting Heifers:

Charting heifers to compare weight and height with standards is becoming of greater interest to dairy producers. This involves determining the height measurement at the shoulder and using the weight of the animal, comparing to a standard as set out in the heifer growth charts available in the Manitoba Agriculture Fact sheet: "**Dairy Management: Charting Heifer Growth**" and "**Heifer Growth**".

Frame size of Heifers at Seven Sisters - 1987

Date:	Age of heifers	Wt. lbs	Ideal wt.	% of ideal	Ht. ins.	Ideal Ht.	% of ideal
Pasture turnout:							
June	6 mos	362	400	**83%**	41	44	**93%**
1st	9 mos	520	616	**84%**	44	47	**94%**
	13 mos	576	770	**75%**	46	50	92%
End of pasture:							
October	11 mos	776	660	**117%**	47	49	**96%**
22nd	14 mos	900	836	**107%**	49	50	**98%**
	18 mos	877	968	**90%**	49	53	**92%**

This table indicates that when the heifers were brought to the Grassland project they were generally under condition for their frame size, however by Oct 22, they had gained enough weight to be classified as well conditioned for their frame size even though they continued to remain below the standards for height and weight for their age.

Heifers that lack the frame size for the required weight may require the use of a proven Sire that improves the stature and size to adjust the scale of future offspring.

Guidelines for Raising Replacement Dairy Heifers

1: Select replacement heifers that have the genetic potential to improve the herd average milk production.

2: Use productive pasture forages with fertility to soil test and a planned grazing system to obtain the most profitable return.

3: Use high quality forage in the feeding of growing heifers. Use feed test results to balance a ration that challenges replacement heifers to achieve the optimum grwoth rate.

4: Consult regularly with your Veterinarian for your own herd health package.

5: Chart heifer performance for weight and height on a regular basis, eg: 6 mos. 12 mos. 24 mos. and compare to the standard heifer growth charts (breed specific) available through Manitoba Agriculture.

EASTERN GRASSLAND SOCIETY - DAIRY HEIFER REPLACEMENT DEMONSTRATION 1987

NAME: print: A1:aF63	owner number	EGS #	birth date	Height inches 6/ 1	8/ 5	10/22	Weight Lbs. 6/ 1	8/ 5	9/30	10/22	12/18	1/19	2/23	3/28	AVDG	wt/d age
Real Brindle	211544	19	4/29/86	48.75	50.25	51.50	667	814	937	981	1100	1100	1093	1142	1.58	1.53
LaBroquerie	211545	15	5/15/86	50.50	51.50	52.50	673	900	970	1036	1142	1159	1212	1243	1.89	1.67
	211546	16	6/27/86	47.25	49.75	50.34	715	818	913	961	1093	1100	1122	1133	1.39	1.51
	211543	17	2/15/86	49.00	50.25	50.25	669	827	961	1005	1100	1093	1133	1146	1.58	1.53
Stephan Brindle	211548	14	8/16/86	47.75	50.50	52.14	649	735	865	902	994	981	992	1019	1.23	1.35
LaBroquerie	214401	13	9/ 7/86	46.50	50.25	50.50	590	735	834	880	996	981	1023	1029	1.46	1.36
Phil Lebrun	1	1	8/ 5/86	42.75	44.50	47.00	482	642	744	796	917	919	959	983	1.66	1.30
St. Anne	2	20	10/29/86	41.25	44.25	45.75	378	521	847	706	818	829	880	900	1.73	1.18
Hanson Holsteins	367	18	10/ 1/86	43.50	46.25	47.75	416	499	623	710	781	814	854	880	1.54	1.15
Steinbach	368	3037	10/ 1/86	42.50	45.50	47.50	482	585	722	807	902	930	985	1029	1.82	1.36
	370	3040	10/ 1/86	43.25	45.25	48.00	378	517	629	693	827	812	853	878	1.66	1.15
	375	3042	10/31/86	43.00	45.50	46.75	440	550	662	735	831	834	886	933	1.64	1.23
Herbsigwill	85	85	7/ 1/86	45.25	46.50	48.50	490	627	757	803	930	944	988	1010	1.73	1.34
Randolph	86	86	7/11/86	45.50	47.25	49.25	477	640	746	790	930	946	955	1005	1.75	1.33
	88	88	7/23/86	45.00	47.25	49.25	440	611	719	816	880	928	948	968	1.75	1.28
	90	90	8/ 5/86	43.00	45.00	48.25	473	625	726	792	886	917	957	996	1.74	1.32
Owen Wilkinson	134327	3	11/ 9/86	42.00	42.75	45.75	398	510	585	664	739	763	803	816	1.39	1.06
Clandeboye	134342	4	12/20/86	41.25	44.50	47.00	370	486	618	686	823	834	873	889	1.72	1.16
	134348	70	12/28/86	39.50	43.75	46.75	306	422	535	589	724	741	809	836	1.76	1.09
	134320	6	11/ 6/86	42.75	45.50	47.00	350	488	625	684	779	800	858	869	1.72	1.14
Brackendale Farm	134338	7	11/28/86	40.50	44.00	46.75	325	458	581	627	748	757	774	814	1.62	1.06
Clandeboye	134337	8	11/24/86	41.50	44.50	47.50	332	464	570	625	750	752	776	820	1.62	1.07
Wm. Meulenbelt	35	12	2/28/86	45.50	47.25	48.75	594	743	878	900	1012	1045	1065	1095	1.66	1.46
Dugald	33	11	1/30/86	44.50	46.25	49.00	504	721	860	931	1067	1054	1087	1109	2.01	1.48
	34	10	2/24/86	43.75	47.25	48.00	530	695	790	869	955	957	970	986	1.51	1.30
	36	9	3/ 7/86	44.00	47.25	49.00	502	708	847	915	1005	1012	1056	1111	2.02	1.48
Hilltop Dairy	21	21	7/22/86	47.25	49.00	51.00	631	730	825	906	977	990	1056	1109	1.59	1.48
Whitemouth	22	22	7/17/86	48.00	48.75	50.50	598	735	853	922	1060	1034	1102	1120	1.73	1.49
	23	23	8/19/86	45.00	46.75	48.50	559	649	739	794	904	906	959	1005	1.48	1.33
	24	24	8/28/86	45.50	47.00	49.50	559	647	752	803	884	893	933	1001	1.47	1.32
Chas Johnson	612	241	9/16/86	44.50	47.50	49.25	526	642	750	823	922	941	988	1014	1.62	1.34
St Andrews	611	240	8/18/86	46.50	47.00	49.00	561	704	823	873	776	807	1043	1089	1.75	1.45
	607	236	6/28/86	44.50	45.00	48.00	484	574	660	700	801	785	812	860	1.25	1.12
	57	237	4/29/86	45.00	45.50	48.50	578	684	818	873	939	957	1034	1080	1.67	1.44
James Scott	182	25	6/18/86	44.25	46.00	48.75	541	618	732	794	880	878	904	913	1.24	1.20
St Anne	179	26	3/24/86	46.00	47.75	49.00	585	660	750	814	875	869	902	946	1.20	1.25
	188	27	7/30/86	45.25	48.00	48.00	541	647	759	794	946	979	994	1001	1.53	1.32
	178	28	3/ 5/86	44.50	46.50	46.25	607	680	750	801	898	904	948	981	1.24	1.30
				44.64	46.78	48.60	511	640	757	811	910	920	963	994	1.61	1.31
			Average:					1.99	2.09	2.45	1.75					

Current feed records:

	lbs fed per head per day as fed:	dry matter
alfalfa-grass hay	23.7	20.60
oats/barley mix	5.9	5.31
mineral fed free choice (16:16)		
Total:	29.6	25.91

Feed Analysis:

Alfalfa-grass hay

	D.M.	Prot.	C.F.	ADF	Ca	P	TDN
Sample #1	87.2	18.2	26.3	33	1.47	.18	63
Sample #2	82.6	18.9	23.8	30	1.55	.17	64

EASTERN GRASSLAND SOCIETY - DAIRY HEIFER REPLACEMENT DEMONSTRATION 1987

NAME: prints Alsac63	owner number	EBS #	birth date	Worm Count 6/ 2/87	Worm Count 10/22/87	Age in mos 12/18/87	Est.age at freshening
Neal Brindle	211544	19	4/29/86	negative	negative	20	29
LaBroquerie	211545	15	5/15/86	negative	negative	19	28
	211546	16	6/27/86	1+ Eimeria bovis.	Strongyle, eimeria	18	27
	211543	17	2/15/86	negative	negative	22	31
Stephan Brindle	211548	14	8/16/86	negative	negative	16	25
LaBroquerie	214401	13	9/ 7/86	1 Eimeria sp.	negative	16	24
Phil Lebrun	1	1	8/ 5/86	negative	negative	17	25
St. Anne	2	20	10/29/86	Trichuris	Eimeria,strongyle	14	22
Hanson Holsteins	367	18	10/ 1/86	negative	Trichuris	15	23
Steinbach	368	3037	10/ 1/86	negative	Eimeria, trichuris	15	23
	370	3040	10/ 1/86	negative	Eimeria	15	23
	375	3042	10/31/86	1+ E.bovis	negative	14	22
Herbsigwill	85	85	7/ 1/86	E.bovis,Eimeria	negative	18	26
Randolph	86	86	7/11/86	negative	negative	18	26
	88	88	7/23/86	negative	negative	17	26
	90	90	8/ 5/86	1 Eimeria sp.	Eimeria	17	25
Owen Wilkinson	134327	3	11/ 9/86	1 E.bovis	Eimeria, bovis	13	22
Clandeboye	134342	4	12/20/86	2 E. bovis	Eimeria, bovis	12	21
	134348	70	12/28/86	1 E. zurnii	negative	12	20
	134320	6	11/ 6/86	4 E. zurnii	Eimeria	14	22
Brackendale Farm	134338	7	11/28/86	negative	Strongyle,eimeria	13	21
Clandeboye	134337	8	11/24/86	2 E. bovis	negative	13	22
Wm. Meulenbelt	35	12	2/28/86	Zurnii,Eimeria	negative	22	31
Dugald	33	11	1/30/86	1 Strongyle sp.	negative	23	32
	34	10	2/24/86	Strongyle,Nemeiza	negative	22	31
	36	9	3/ 7/86	negative	Strongyle	22	30
Hilltop Dairy	21	21	7/22/86	E. bovis	Strongyle	17	26
Whitemouth	22	22	7/17/86	negative	Stongyle	17	26
	23	23	8/19/86	negative	negative	16	25
	24	24	8/28/86	negative	negative	16	25
Chas Johnson	612	241	9/16/86	1+ E. bovis	Eimeria	15	24
St Andrews	611	240	8/18/86	1+ E. bovis	Stongyle	16	25
	607	236	6/28/86	few E.bovis	negative	18	27
	57	237	4/29/86	negative	negative	20	29
James Scott	182	25	6/18/86	negative	Eimeria	18	27
St Anne	179	26	3/24/86	E. zurnii	negative	21	30
	188	27	7/30/86	few E. bovis	Stongyle	17	25
	178	28	3/ 5/86	negative	Eimeria	22	30
				16/38 negative	20/38 negative	17	26

Note: Average:

These heifers were vaccinated at pasture turnout for blackleg, fly tagged, dewormed with a Paratec bolus and turned out on a grass-legume pasture. They were fed 2-3 lbs of oats on pasture which was increased to 6 lbs daily in August plus free choice mineral.

In October the heifers were vaccinated with Triangle 3, 8-way and treated with Ivomec.

Breeding of the heifers started in December.

Soil Management Demonstrations

Roughland Forage Establishment:

The EGS has available for rent, at a cost of $40 per day, forage seed equipment suitable for various roughland forage seeding.

Drum Roller Seeder is a 12'x5' steel roller equipped for seeding small and large forage seeds. The drum when filled with water can weigh up to 10 tonnes and is suitable for pushing in small stones and roots as well as leveling and seeding a forage crop in newly broken land.

Cooperators were:

Len Winnicki	Stuart Thompson
Myron Gavaga	John Johnson
Urs Schlup	Don Fiebelkorn
Gary Naurocki	

Cambridge Roller Seeder is a smaller version of the drum roller, 12'x1.5' roller also equiped for seeding both small and large forage seeds. It is used for areas where the soil surface has been well prepared.

Cooperators were:

Buck McKewen	Marc Lanouette
Joe Neduzak	Eric Eising
Bernie Grycki	Duff MacFadden
Wayne Marino	Gary Naurocki

Pasture renovation has always been a costly process particularly if the pasture is on marginal soil that has limitations of stone, swamp or brush that makes tillage difficult or impossible. The Eastern Grassland Society and Manitoba Agriculture have been working with sod seeding for over 10 years using some different sod seeding equipment. The success of the sod seeding has been variable, as in some situations there have been excellent results, in others dismal failures usually due to drought or insects. It has been observed, however, that it does take time for the plants to become established. It also has been observed that some lower cost methods of pasture improvement do have potential.

EGS has two drills available, a John Deere PowerTill and a Moore Uni-Drill. This year two demos. included the use of Furadan granules which could reduce seedling losses due to insects or perhaps seed diseases.

Cooperators were:

Jim Scott - seeded 20 acreas to alfalfa with Furadan and 20 acres without Furadan to determine any advantage.

Al Tymko - seeded 10 acres to alfalfa with Furadan.

Ed Wittenberg - seeded 20 acres to alfalfa.

Frost seeding or broadcasting of alfalfa or trefoil during the dormant period may have potential as an effective method of improving pastures in the Eastern Region.

Legumes broadcast in the late winter or fall using a broadcaster set on an ATV, snowmobile or tractor or by aerial broadcasting have given some good results. The moisture from the snow melt as well as the freezing-thawing conditions are used to take the seed down to where it is suitable for germination. Later seeding in spring usually require some method of sod disturbance with a cultivator or chain harrow so that the seed has good soil contact.

The use of phosphate fertilizer and a controlled grazing system are also required to give conditions suitable for establishment. Intensive grazing should be started in early spring to reduce the competition from native grass but then the stock should be restricted from the pasture as the seedlings emerge to allow for establishment. A 6-8 week period should be allowed before regrazing. The use of electric, high tensile fencing is very effective for subdividing pastures being renovated.

Some of the producers who have used this low cost method of pasture renovation have had some good results. **Lorne Blocker** of Dugald aerial seeded some rough land pasture in the spring of 1984 and observes a good stand of both alfalfa and trefoil in his bush pasture. **Ken Blocker** in a neighboring field seeded an alfalfa-trefoil mix into his pasture last spring using an

broadcaster mounted on an ATV. He observed some good germination of the legumes last summer. By subdividing his pasture he plans to allow enough rest period to maintain the legumes in the pasture. **Conrad Caya** of Great Falls also seeded the alfalfa-trefoil into his pasture and although he feels that it is too early to judge the success, initial results indicate that it has potential as a low cost method of improving a permanent pasture.

The Eastern Grassland Society has a broadcaster that can be mounted on an ATV and a chain harrow for use by Society members.

"Still think two bales is enough?"

Forage Fertility Demonstrations

The additional yield and added forage quality that results from the application of the proper balance of fertilizer to forage crops makes this practice a very profitable one. This is the experience of several farmers who applied fertility strips on their alfalfa fields as part of an Eastern Grassland Society forage fertility demonstration program this past summer.

By the use of a 20 ft. Valmaar broadcaster, fertilizer strips were applied to a number of alfalfa fields in the Eastern region by the Eastern Grassland Society and Manitoba Agriculture. The fertility rates varied according to the soil test requirements and to the rates the farmer was interested in applying. Assessment was by visual appraisal, a tissue test or by harvesting representative samples for yield determination.

The economic benefit from these demonstrations considering the additional yield and subtracting the additional fertilizer cost showed a varied response. In all cases the farmer was impressed with the results. In some situations the lack of response where the fertilizer rate was in excess of what was required for an economic yield was of equal importance as it stressed the importance of soil testing to determine the economic rate of fertility.

Some of the farm results are indicated in the following tables:

Location: **Ed Grenier, Beausejour** (applied May 1986)

Treatment:	tons.DM /acre	% of check	fert. $/acre	net return per acre (1)
check	1.17	100%		46.80
60 P	1.67	143%	$20.64	46.16
120 P	2.03	174%	$41.28	39.92
120P-120K	2.17	185%	$50.40	36.40
120P-120K-60S	2.22	190%	$62.94	25.86

Note: (1) market hay price at $40/ton.and yield determined by sq. meter samples.

Ed Grenier: Beausejour Tissue Test

Treatment:	% P	rating	% K	rating	% S	rating
check	0.12	low	2.0	suff.	0.21	marginal
60 P	0.16	low	2.3	suff.	0.25	sufficient
60P +60K	0.18	low	2.4	suff.	0.20	marginal

Location: **Norman Lussier, Lac du Bonnet**

Treatment:	ton DM /acre	% of check	Fert. $/acre	net return per acre
check	0.88	100%	$0.00	$35.20
30 P	1.54	175%	$9.98	$51.62
60 P	1.73	197%	$19.78	$49.42
90 P	1.92	218%	$29.76	$47.04
120 P	1.67	190%	$39.73	$27.07
180 P	1.81	206%	$59.51	$12.89

Note: (1) market hay price at $40/ton.and yield determined by sq. meter samples.

Norman Lussier: Lac du Bonnet Tissue Test

Treatment:	% P	rating	% K	rating	% S	rating
check	0.11	low	2.0	suff.	0.2	marginal
90 P	0.15	low	2.4	suff.	0.21	marginal

Location: **Brian Proceviat, Elma**

Treatment:	Yield ton/ac	% of check	Fertilizer cost/acre	Net return per acre
check	0.63	100%		$25.20
30 P	0.87	138%	$9.98	$24.82
60 P	0.92	146%	$19.78	$17.02
90 P	1.28	203%	$29.76	$21.44
120 P	1.32	210%	$39.73	$13.07

Note: (1) market hay price at $40/ton.and yield determined by sq. meter samples.

Brian Proceviat: Elma Tissue Test

Treatment:	% P	rating	% K	rating	% S	rating
check	0.15	low	2.2	suff.	0.30	suff.
120 P	0.21	marginal	2.0	suff.	0.22	marginal

How much fertilizer is enough for a maximum yield is a question often asked. The yield of an alfalfa crop is due to a number of factors but fertility and available moisture are the two major limitations. The use of a tissue test to determine the nutrients being picked up by the plant is one of the most accurate ways of determining "how much is enough", and will assist in the planning of an economic fertilizer program.

In three other fertilizer demonstrations, there was no visual or apparent improvement in forage yield even at very high fertility rates. When a sample of the plant was taken at the early bloom stage, the plant tissue indicated that there was sufficient nutrients in the plant for an economic yield, indicating another factor such as moisture as limiting the yield potential.

Cornie Goertzen: Steinbach

Treatment:	%P	rating	% K	rating	% S	rating
check	0.29	suff.	1.4	low	0.26	suff.
30 P	0.32	suff.	1.6	low	0.25	suff.
50 P	0.32	suff.	1.5	low	0.25	suff.
30P +30K	0.30	suff.	1.8	marginal	0.32	suff.
30P +30K +27 S	0.32	suff.	2.0	marginal	0.32	suff.

Alvin Plett: Landmark

Treatment:	% P	rating	% K	rating	% S	rating
check	0.29	suff.	2.7	suff.	0.41	suff.
30 P	0.29	suff.	3.0	suff.	0.39	suff.
50 P	0.35	suff.	2.7	suff.	0.45	suff.
30P +30K	0.33	suff.	2.7	suff.	0.41	suff.
50P +30K	0.32	suff.	2.6	suff.	0.37	suff.

Randy Budge: Selkirk

Treatment:	% P	rating	% K	rating	% S	rating
check	0.13	low	2.1	suff.	0.17	low
90 P	0.13	low	2.1	suff.	0.11	low

PFRA Demonstration Projects

PFRA projects include practical demonstrations on methods of reducing soil erosion in areas where there is an erosion problem. Projects include:

Green Manure Cropping: assistance for establishing crops suitable for soil incorporation to improve the organic matter to reduce soil erosion ($10/acre, max. 160 acres).

Conservation Tillage: assistance to evaluate reduced tillage for crop establishment ($20/acre, max. 80 acres).

Critical Area Treatment: assistance to correct soil erosion problems particularly for the establishment of forage on these soils ($50/acre).

Field Shelterbelts: assistance to establish and maintain field shelterbelts in areas where soil erosion from wind is a problem ($150/ml for estab. $80/ml for maintenance).

Please note that the number of projects and financial assistance available is limited. EGS directors reserve the right to locate projects in the areas where soil erosion is of the greatest concern.

Green Manure Cropping:

Green manure crops have been considered an accepted method of improving the soil structure particularly in soils susceptible to erosion and for improving the fertility of the soil where the crop is a legume. A green manure crop is one that is worked into the soil to provide additional organic matter and nutrients to the soil and to subsequent crops.

There are a number of potential crops that could be used for green manure. Sweet clover is a traditional green manure crop but as it is a biennial it does not always fit into an intensive cropping system particularly if there are difficult weed problems. Other potential crops are annuals such as: Peas, Lentils, and Fababeans. The potential nitrogen production from these crops is well documented (Table 1) but what are the practical cultural problems? Most of these crops are poor weed competitors and the cost of the weed control could more than

offset any potential benefit of the improved organic matter or fertility.

Table 1: Nitrogen Fixation in Legumes Grown in W. Canada

Legume:	Nitrogen fixed/ha
Alfalfa	300
Clover	200
Fababeans	150
Soybeans	100
Lentils	80
Field Beans	70

Demonstrations conducted by the Eastern Grassland Society funded by PFRA, have evaluated the potential of several green manure crops in the Beausejour area this past year.

The two cooperators in this demonstration were Gary Naurocki (Table 2) and Pat Horosko (Table 3) of Beausejour. The crops evaluated were: Peas (Century and Austrian), Black Lentils and Fababeans. In each trial, the crop yield was estimated prior to working into the soil and an estimate of the potential fertility added.

Table 2: Cooperator: Gary Naurocki

Crop	tons DM/ac	lbs N fixed/ac	seed cost $/ac	Value of N. $/ac
Century Peas	2.55	42.5	$15	$9.35
Austrian Peas	1.98	33.0	$15	$7.26
Black Lentils	1.37	22.8	$7	$5.02
Fababeans	1.36	22.7	$10	$5.00

Table 3: Cooperator: Pat Horosko

Crop	tons DM/ac	lbs N fixed/ac	seed cost $/ac	Value of N. $/ac
Century Peas	0.70	11.7	$15	$2.57
Black Lentils	0.45	7.5	$7	$1.65

Note: The Nitrogen fixed was estimated from the analysis of the plant as determined by the feed lab. The value of the nitrogen was at a commercial rate of $0.22 per lb.

Observations:

The peas and fababeans had good top growth up to three feet in height when worked down, the lentils were very short approximately 12 inches. All crops were very uncompetitive and weed growth was the major limitation.

The estimated value of the fixed nitrogen did not cover the cost of the seed, however, there is the additional benefit of increased soil organic matter and the improved soil structure that is difficult to evaluate except with subsequent crops.

In this project the use of a green manure crop may be of limited economic value, but may have some soil improvement benefits that would be useful to a crop rotation program.

At St Pierre another demonstration with fababeans as a plow down on 20 acres was compared to 20 acres in the same field cultivated as summerfallow. The fababeans were seeded in May, however, weeds were very competitive particularly pigweed. The fababeans were worked down in early July and this fall a soil test from the fallow field and the fababean field were compared for the level of nitrogen.

Effect of Fababeans as a Green Manure - St Pierre 1987

	lbs/ac N	% org.mat.	Value additional N
Fababeans	213		$15.40/acre
Fallow	143		

This trial also indicates a value from the green manure crop from the additional nitrogen produced. The value of this nitrogen must be compared to the cost of the seed and any additional cultivation and seeding cost.

Critical Area Treatment Demonstrations:

Soil drifting can be a major problem in some areas of the Eastern Region. Sandy loam soils, particularly in the La Broquerie and Marchand areas, have had a history of erosion usually in the spring prior to seeding and occasionally in the summer if due to drought, the crop cover is limited. Soil erosion can also occur in other areas of the Region where conditions for soil movement is suitable. Combating this loss of a valuable resource is a responsibility of all producers.

The choice of the most adaptable crop for these soils is the key to reducing losses to erosion. The PFRA critical area demonstration program has been helpful to some producers in the Eastern Region who considered seeding to forages as the solution to erosion.

Eric Eising, who farms south of La Broquerie, had a 40 acre field that had a history of poor crops due to losses from soil erosion. The field was of particular concern with the dry winds in the spring and fall. Previous attempts to establish forage on this field were unsuccessful as the soil drifting would kill out the emerging seedlings. In the spring of 1987, with the assistance of PFRA and the Eastern Grassland Society, the soil was stabilized with the use of a heavy application of manure in the spring, a cover crop of oats was seeded and a forage mixture of alfalfa, timothy and crested wheat seeded with the EGS roller seeder. This roller seeder leaves ridges in the field which reduce potential erosion from the wind and provides a good seed bed for forages. Eric credits the successful establishment on the use of the roller seeder and the fertility also applied to soil test recommendation for a vigorous seedling stand. Timely rains were also a major factor.

Helmut Kebernick, who farms north of Beausejour, had one 15 acre field on a sandy loam soil where wind erosion had created soil drifts almost three feet high against the fence line. Establishing this field to forages was the solution. A crop of oats was seeded in early spring on this field to stabilize the soil and when the crop was approximately four inches high, a

mixture of alfalfa, timothy, crested wheat and brome was seeded. Soil drifting did reduce some of the seedling stand but the use of adequate fertility insured good seedling vigor and by the fall of 1987, the forage crop was well established and the soil erosion checked!

Shelterbelts Check Soil Erosion :

Soil erosion on some of the fine clay soils of the Red River Valley can be a serious problem and particularly in the St. Pierre area. As forage crops are not always the economic answer for this problem on some of these more productive soils, the use of shelterbelts to provide wind protection has been demonstrated as being an effective alternative.

Through the assistance of PFRA and the EGS, the establishment of field shelterbelts have been promoted in the areas where soil drifting has been a major problem.

Approximately 22 miles of shelterbelts have been established in the St Pierre area in the last two years and for the next two years an additional 25 miles will planted.

The St Pierre producers have built a special sprayer for weed control in shelterbelts and have developed a good system of shelterbelt establishment. Soil erosion is being checked by these measures.

"Rain increases the nitrogen of the soil . . . if we'll have any left."